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REMARKS

The present response is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Applicant asserts that the present invention is new, non-obvious and useful. Favorable reconsideration and allowance of the claims is respectfully requested.

Status of Claims

Claims 10-28 are pending in the application.

New Claims 29-35 have been added herein. Accordingly, Claims 10-35 are now pending.

Claims 10-13, 17-20, 26 and 28 have been amended herein.

Applicant respectfully asserts that no new matter has been added by the amendments and new claims.

Examiner Interviews

Applicant thanks Examiners Carol See and Examiner Rajesh Khattar for attending two telephone interviews with Applicant's representatives Milo (Yamima) Eadan (Registration No. 64,764) on December 15, 2010 and January 12, 2011.

During the interview on January 12, 2011, agreement was reached that Claims 10 and 28, as amended herein, are allowable over the references of record, Widdicks, Rubinstein and Breen (full cited below). In particular, agreement was reached that none of these references teaches to compute a value for node vega at each node of the binomial tree using a single volatility for all nodes in the binomial tree (Claims 10 and 17) or to calculate a value of vega for each tree using values of the option price calculated at nodes of a single tree using a single volatility for all nodes in the single tree (Claim 28). Agreement was also reached that current Claims 11-13 and 26 reciting "the computing device is configured to compute" overcome the objections to the Claims.

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Claim Objections

In the Office Action, the Examiner objected to Claims 11-13 and 26 for failing to recite a machine with a computing device configured to perform certain actions. The Examiner stated that claim 10 properly recites a machine but claims 11-13 and 26 fail to mirror the language of claim 10.

Claims 11-13 and 26 have been amended herein in accordance with the Examiner's observations, namely to mirror the language of claim 10. Accordingly, Applicant respectfully requests that the Examiner withdraw the objection to the claims.

CLAIM REJECTIONS

35 U.S.C. § 112 Rejections

In the Office Action, the Examiner rejected Claims 10, 17, 24 and 25 under 35 U.S.C. § 112, second paragraph, as being indefinite, and claims 11-16 and 18-27 for depending from rejected base claims.

In particular, the Office Action states that the phrases "using a function of the values for node vega computed at the nodes" and "using a function of the value of vega computed for the binomial tree" in Claims 10 and 17 and "using a recursive function of the values for node vega computed at the nodes" in Claims 24 and 25 are indefinite because it is unclear as to the meaning of "using a function of", the Examiner querying "what is the function?" and "how is it done?".

Independent claims 10 and 17 have been amended to recite "[computing] a value for vega ... using the values for node vega computed at the nodes" and "[computing] a value for the implied volatility of the American option using the value of vega computed for the binomial tree." Claims 24 and 25 have been amended to recite "[computing] a value for vega for the binomial tree recursively using values for node vega computed at the nodes." Accordingly, amended claims 10, 17, 24 and 25 no longer recite the language "using a function of".

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Applicant respectfully asserts that these limitations in amended claims 10, 17, 24 and 25 are definite, in light of the Specification, for example, equations (5) and (6) of Fig. 1 and page 8, lines 5-13, and page 6, line 20 - page 7, line 1. In fact, Applicant has added new claims 29-35 to define examples of these functions for clarity. New claims 29-32, dependent upon amended independent claims 10 and 17, and new claims 33 and 34, dependent upon amended dependent claims 24 and 25, define example functions used to compute vega and node vega. Applicants note that different functions (equations (5) and (6)) may be used under different circumstances. For example, equation (5) may be used when an option is *not* exercised at a sub-period of time corresponding to a node, and equation (6) may be used when an option *is* exercised at a sub-period of time corresponding to a node, as described on page 3, lines 3-5 and page 8, lines 5-11 of the application as filed.

Applicants note that independent claim 28 has also been amended to delete the language "using a function of". New claim 35, dependent upon amended independent claim 28, as well as claims 15 and 22, define an example numerical optimization function, the Newton-Raphson method, used to calculate the implied volatility of American options using vega, as described on page 6, line 20 - page 7, line 1 of the application as filed.

Applicant respectfully requests that the Examiner withdraw the rejections under 35 U.S.C. § 112.

35 U.S.C. § 103 Rejection

In the Office Action, the Examiner rejected claims 10-28 under 35 U.S.C. § 103(a), as being unpatentable over Widdicks et al. (On the Enhanced Convergence of Standard Lattice Methods for Option Pricing, 2002, "Widdicks") in view of Rubinstein (Implied Binomial Trees, 1994, "Rubinstein") and further in view of Breen (The Accelerated Binomial Option Pricing Model, 1991, "Breen"). Applicant traverses this rejection in view of the remarks that follow.

Each of independent claims 10 and 17, as amended, includes, *inter alia*:

[computing] a value for node vega at each node of the binomial tree for the corresponding sub-period of time using a single volatility for all nodes in the binomial tree.

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Independent claim 28, as amended, includes, *inter alia*:

to calculate a value of vega for each tree using values of the option price calculated at nodes of a single tree using a single volatility for all nodes in the single tree.

Applicant asserts, and the Examiners agreed in the Interview of January 12, 2011, that none of Widdicks, Rubinstein or Breen teaches these limitations. Accordingly, independent claims 10, 17 and 28 are allowable over Widdicks, Rubinstein and Breen.

Each of claims 11-16 and 18-27 depends, directly or indirectly, from one of amended independent claims 10 and 17, and therefore includes all the limitations of one of these claims. Therefore, Applicant respectfully asserts that claims 11-16 and 18-27 are likewise allowable.

Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of claims 10-28 under 35 U.S.C. § 103.

New Claims

Each of new claims 29-35 depends from one of amended independent claims 10, 17 and 28, and therefore includes all the limitations of one of these claims, which as discussed are allowable. Therefore, Applicant respectfully asserts that claims 29-35 are likewise allowable.

Conclusion

In view of the foregoing amendments and remarks, Applicant asserts that the pending claims are all allowable. Should the Examiner have any question or comment as to the form, content or entry of this paper, the Examiner is requested to contact the undersigned at the telephone number below. Similarly, if there are any further issues yet to be resolved to advance the prosecution of this application to issue, the Examiner is requested to telephone the undersigned counsel.

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In addition, the Commissioner is hereby authorized to debit any and all fees due in connection with this submission and application from our Deposit Account No. 50-3355.

Favorable reconsideration of the application and allowance are respectfully requested.

Respectfully submitted,



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